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Library List No. 34

Washington 25, D. C., January 1947

ECONOMIC ASPECTS OF FOREST-FIRE PROTECTION AND DAMAGE

A List of References

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Forest fires have taken and continue to take a tragic toll in timber burned, wild animals and birds destroyed, scenic and other intangible values ruined, and human lives lost. This bibliography is concerned with the economic aspects of the forest fire problem in the United States and Canada. It is limited to references on losses which can be measured in monetary terms, on the recognition and evaluation of these losses, on the relation between protection costs and potential damage, and to statistics of public and private protective agencies. Articles on insurance and controlled burning are included only if they have a specific bearing on one of these phases of the subject.

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Later reports include estimates of damage done by individual fires.
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Include financial reports.
157. COLBY, F. H. Forest protection and conservation in Maine, 1917, 1919. 2 v. Lewiston, Maine Dept. of Forestry, 1917-19? 99.5 M28
Includes some estimates of damage from individual fires.
158. CONNECTICUT. STATE FORESTER. Report, 1st-9th, 1905-1916. New Haven, 1905-17. 99.9 C761
Include forest fire statistics.
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Include forest fire statistics.
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Discusses various types of damage and estimates value of damage to mature timber, reproduction, grazing, improvements, and crops in Louisiana in 1917.
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Report of meeting of Western Forestry and Conservation Association.
Figures include footage killed, footage beyond salvage, cost of fire work, and loss to settlers.

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Include forest-fire statistics.
170. GIFFORD, J. Report on forest fires for season of 1895. N. J. Geol. Survey Rpt. on Forestry, 1895, p. 157-182. Trenton, 1896. 406 N46R
Reports damage done by individual fires.
171. HAWES, A. F. Forest fires in Connecticut, 1910-1922 (inclusive). 28 p., illus. Hartford, Conn. State Park and Forest Comm., 1923. 99.51 H31
172. HAWES, A. F. Forest fires in Vermont. Vt. Forest Serv. Pub. 2, 48 p. Burlington? 1909. 99.9 V592
Includes summary of fire reports, by towns, 1905-1908, and detailed reports of five districts.
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Includes table showing comparison of costs and damage of fires caused by railroads with those from other causes, in Connecticut, 1917-1921.
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Tables show burned areas and damage by counties.
175. INDIANA. DEPT. OF CONSERVATION. DIVISION OF FORESTRY. Forest fires in Indiana. 9 p., illus. Indianapolis, 1939. 99.51 In2
Refers to intangible damages as well as timber loss, which is evaluated for 3-year period 1935-1937.
176. KENTUCKY. FORESTRY DEPT. Biennial report, 3d-6th, 1927/28-1934/35. Frankfort, 1929-36. 2 K41R
In Biennial Report of Kentucky Dept. of Agriculture, Labor, and Statistics.
Include forest-fire statistics.
177. LEETE, B. E. Forest fires in Ohio, 1923 to 1935. Ohio Agr. Expt. Sta. Bul. 598, 54 p., illus. Wooster, 1938. 100 Oh3S
Damage, p. 20-25.
178. LOS ANGELES COUNTY. DEPT. OF FORESTER AND FIRE WARDEN. Annual report, 1925/26-1944/45. Processed. Los Angeles, 1926-45. 99.9 L89
Timber, watershed, and improvement damage are usually estimated separately.
179. LUND, C. E. Forest fire fiend rampant as never before. If Canadian timber is to be preserved greater measures of protection must be instituted. The necessity of prompt action on the part of every citizen. Canada Lumberman 43(4): 53. Feb. 15, 1923. 99.81 C16
Includes report of number of forest fires in New Brunswick in 1921 and 1922, with estimated acreage and property loss.
180. MAINE. FOREST COMMISSIONER. Biennial report, 1st-24th, 1891-1942. Augusta, 1892-1942. 99.9 M28R
Include forest fire statistics.
181. MAINE. FORESTRY DISTRICT. Activities...for the season of 1927. 22 p. Augusta, 1928. 99.51 M28A
Includes tables showing date, area, cause, and damage of each fire and summaries by months, by counties, and by causes.

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Include fire statistics.
183. MASSACHUSETTS. DEPT. OF CONSERVATION. Annual report, 1920-1939/40. Boston, 1920?-41? 99.9 M384
Include forest-fire statistics.
184. MICHIGAN. DEPT. OF CONSERVATION. Annual forest fire report, 1912/13-1921. Lansing, 1913-22. 99.9 M585
Tables include estimates of losses.
185. MINNESOTA. DEPT. OF CONSERVATION. Biennial report, 1931/32-1941/42. St. Paul, 1933-42. 279.9 M66
Include statistics on forest fires, including estimates of damage.
186. MINNESOTA. FORESTRY COMMISSIONER. Short special report on forest fires in Minnesota, 1908. 22 p., illus. St. Paul? 1909. 99.51 M66
Includes summary of forest fires, giving acreage and damage of each.
187. MISSISSIPPI. FORESTRY COMMISSION. Biennial report, 1st-9th, 1925/26-1942/43. Jackson, 1927-43. 99.9 M694B
Include some figures on forest-fire damage and costs of control.
188. MITCHELL, J. A., and SAYRE, H. R. Forest fires in Michigan. 65 p., illus. Lansing, Mich. Dept. of Conserv., 1931. 99.51 M69F
U. S. Forest Service cooperating.
A detailed study based on State records.
189. MITCHELL, J. A. Forest fires in Minnesota. 74 p., illus. Minneapolis, Minn., Syndicate Print. Co., 1927. 99.51 M69
Forest Service, State of Minnesota, in cooperation with U. S. Forest Service.
A compilation and analysis of the State's forest fire statistics for 1915-1924.
190. MONTANA. STATE FORESTER. Report, 1910-1937/38. Missoula, 1911-39. 99.9 M762
Include fire damage and protection statistics.
191. MORRIS, W. G. The Tillamook Burn - its area and timber volume. U. S. Forest Serv. Pacific Northwest Forest Expt. Sta. Forest Res. Notes 18: 2-4, illus., processed. 1936. 1.9 F7629Fr
Map and statistical tables.
192. MOWRY, J. B. Rhode Island's loss is \$9000 [in 1913]. Amer. Forestry 19: 758. Nov. 1913. 99.8 F762
Forty-six fires burned 6,720 acres, largely sprouts and brushland previously burned over.
193. NEW BRUNSWICK. DEPT. OF LANDS AND FORESTS. Annual report, 1860/61-1944. Fredericton, 1861-1945. 253.3 C88
Include Forest Service report, with fire statistics.
194. NEW HAMPSHIRE. FORESTRY AND RECREATION COMMISSION. Biennial report, 1885-1943/44. Illus. Concord, 1885-1944. 99.9 N45R
Title and report period vary.
Later years include tables analyzing forest-fire causes, damage, etc.

195. NEW JERSEY. DEPT. OF CONSERVATION AND DEVELOPMENT. Annual report, 1914/15-1926/27. Trenton, 1916-27. 279.9 N46
Include report of State firewarden, with statistics of forest fires.
196. NEW YORK (STATE). CONSERVATION DEPT. Annual report, 1st-33d, 1911-1943. Albany, 1912-44. 279.9 N48
Include reports on forest fire losses.
197. NORTH CAROLINA. DEPT. OF CONSERVATION AND DEVELOPMENT. Biennial report, 1st-8th, 1924/25-1939/40. Raleigh, 1926-40. 279.9 N81
1st-2d include forest fire statistics for entire State, 1909-date; 3d-8th include current statistics for protected areas.
198. NORTH CAROLINA. GEOLOGICAL AND ECONOMIC SURVEY. Great damage from recent forest fires. N. C. Geol. and Econ. Surv. Press Bul. 39, 8 p. Chapel Hill, 1910. 406 N81P
Includes estimates of damage on specific plots.
199. NORTHERN MONTANA FORESTRY ASSOCIATION. Annual report, 7th-33d, 1917-1943. Kalispell, Mont., 1918-43. 99.9 N817
Include detailed statistics of fire control costs.
200. NOVA SCOTIA. DEPT. OF LANDS AND FORESTS. Report, 1926-1945. Halifax, 1927-46. 99.9 N85
Include forest fire statistics.
201. ONTARIO. MINISTER OF LANDS AND FORESTS. Report, 1906-1940/41. Toronto, 1907-42. 253.6 L23
Include forest fire statistics.
202. OREGON. STATE FORESTER. Annual report, 1911-1943/44. Salem, 1912-44. 99.9 Or32A
1942/44 biennial.
Include tables of fire-fighting costs and losses.
203. OREGON FOREST FIRE ASSOCIATION. Annual report, 1911-29. Portland, 1912-30. 99.9 Or33
Include financial reports.
204. OTTAWA RIVER FOREST PROTECTIVE ASSOCIATION, LTD. Annual report, 8th-32d, 1921-1945. Ottawa, 1922-46. 99.9 Ot8
Statistics include costs of patrol and of fire fighting per acre.
205. PEND D'OREILLE TIMBER PROTECTIVE ASSOCIATION. Annual report, 1911-1930. Sandpoint, Idaho, 1911-30. 99.9 P37
Include financial reports and statistics of fires and fire damage.
206. PENNSYLVANIA. DEPT. OF FORESTRY. Report of the Chief Forest Fire Warden, 1915-18. Pa. Dept. Forestry. Bul. 13, 16, 17, 19. 4 v. Harrisburg, 1916-19. 99.9 P38B
Include statistics of damage and costs of extinction.
207. PETTIS, C. R. \$60,000 loss in New York State [in 1913]. Amer. Forestry 19: 750-752. Nov. 1913. 99.8 F762
Estimate of damage caused by over 500 fires burning over about 60,000 acres.
208. PLUMMER, F. G. Forest fires: their causes, extent and effects, with a summary of recorded destruction and loss. U. S. Forest Serv. Bul. 117, 39 p., illus. Washington, D. C., 1912. 1 F76B
Table 4, p. 26-39, summarizes number of fires, area burned, and amount and value of damage, by States (and Provinces of Canada and Newfoundland), of recorded fires previous to 1912.

209. QUEBEC. FOREST PROTECTION SERVICE. Report on the protection of the forests, 1924-1931. 8 v. Quebec, 1925-32. 99.8 Q33
Statistics are given usually in terms of acres burned.
210. QUEBEC. MINISTER OF LANDS AND FORESTS. Report, 1930/31-1942/43. Quebec, 1932-44. 253.8 L23
Include annual reports of the Forest Protective Service, with statistics of fire damage and costs.
211. ST. MAURICE FOREST PROTECTIVE ASSOCIATION, LIMITED. Annual report, 10th-28th, 1921-1939. Three Rivers, Quebec, 1921-39. 99.9 Sa22
Include financial reports and statistics of numbers and areas of forest fires.
212. SASKATCHEWAN. DEPT. OF NATURAL RESOURCES AND INDUSTRIAL DEVELOPMENT. Annual report, 1930/31-1944/45. Regina, 1932-45. 279.9 Sa7
Include forest fire statistics.
213. SHOW, S. B., and KOTOK, E. I. Forest fires in California, 1911-1920: an analytical study. U. S. Dept. Agr. Dept. Cir. 243, 80 p., diagrs. Washington, D. C., 1923. 1 Ag84D
Correlates various factors of cause, size of fires, prevention and suppression costs, and damage.
214. SILCOX, F. A. How the fires were fought. Amer. Forestry 16: 631-639. Nov. 1910. 99.8 F762
Reviews 1910 fire season in Region One, with estimates of direct and indirect losses.
215. SOME comparative figures on forest fire losses in the South. Lumber World Rev. 49(9): 106. Nov. 10, 1925. 99.81 L972
Table shows damage by fires, cause of fires, and expenditures for prevention and protection for eleven Southern and three Pacific Coast States.
216. SOUTH CAROLINA. STATE COMMISSION OF FORESTRY. Report, 1928-1944/45. Columbia, 1929-45? 99.9 So83
Include statistics of number and area of forest fires.
217. SOUTHERN IDAHO TIMBER PROTECTIVE ASSOCIATION. Annual report, 1928-1937. Boise, 1928?-38. 99.9 So89
Include financial statements and statistics of fire damage.
218. SOUTHERN ST. LAWRENCE FOREST PROTECTIVE ASSOCIATION. Annual report, 1st-28th, 1917-1944. Val-Brillant, Quebec, 1917-44. 99.9 So86
Include financial reports and statistics of forest fires on association territory.
219. SOUTHERN WEST VIRGINIA FOREST FIRE PROTECTIVE ASSOCIATION. History, accomplishments, aims: eight years of forest fire protection in southern West Virginia, 1916 to 1924. 58 p., illus. Charleston, W. Va., 1924. 99.9 So88H
Includes particulars of expenditures and losses for 1923.
220. SPECIFIC data covering cost of a forest fire argues for protection. Pacific Lumber Trade Jour. 19(1): 34. May 1913. 99.81 P112
Compares losses on privately owned and adjacent national-forest land in Modoc County, Calif., resulting from a forest fire in 1910.
221. STICKEL, P. W. The causes and cost of forest fires in central Massachusetts. U. S. Forest Serv. Northeast. Forest Expt. Sta. Tech. Note 2, 2 p., processed. Amherst, Mass., 1929. 1.9 F7622T
For fuller treatment see next item.

222. STICKEL, P. W. Forest fires in central Massachusetts, their causes and cost to the Commonwealth. Jour. Forestry 27: 841-844. Nov. 1929. 99.8 F768
Includes table showing damage and suppression costs for 1926-1928. Attention is called also to the indirect loss to the community through manpower diverted from other work for fire fighting.
223. TENNESSEE. STATE FORESTER. Biennial report, 1921/22-1933/34. Nashville, 1923-34. 99.9 T252R
Include forest fire protection and damage statistics.
224. TEXAS. FOREST SERVICE. Annual report, 1st-25th, 1915/16-1940. College Station, 1916-41. 99.9 T31
Include forest fire statistics.
225. THURKILDSON, H. Florida's forest fire loss greatest in Nation. Amer. Eagle 40(36): 1. Dec. 27, 1945. 6 Am327
Gives total acreage burned and estimated damage for State in 1944.
226. U. S. FOREST SERVICE. National forest fire report, calendar year 1945. 26 p., processed. Washington, D. C., 1946. 1.962 A2N212
Consists of six tables showing number of fires, area burned, and damage, by causes, on national-forest land and other land, and other pertinent figures.
227. U. S. FOREST SERVICE. DIVISION OF STATE COOPERATION. Forest fire statistics, 1931/32-1945. Processed. Washington, D. C., 1933-46. 1.9 F76Ffs
228. U. S. FOREST SERVICE. INTERMOUNTAIN DISTRICT. Forest fires in the Intermountain Region. U. S. Dept. Agr. Misc. Cir. 19, 16 p., illus. Washington, D. C., 1924. 1 Ag36Cm
Estimates losses due to destruction of timber, forage, and watersheds.
229. UPWARDS of thirty million feet of logs and over quarter million dollars worth of equipment lost through 1919 forest fires. West-Coast Lumberman 37(432): 34, 51. Oct. 1, 1919. 99.81 W52
Statistics for various types of loss by counties, for Washington.
230. VERMONT. FOREST SERVICE. Annual report, 1st-8th, 1908/09-1915/16. Montpelier, 1909-16. 99.9 V592A
Include forest fire statistics.
231. VERMONT. FOREST SERVICE. Biennial report, 1922/23-1943/44. Burlington, 1924-44? 99.9 V592B
Reports for 1916/17-1921/22 in Vermont. State Board of Agriculture. Reports. 2 V593
1936/37-1941/42 are in Vermont. Dept. of Conservation and Development. Reports; 1942/43-1943/44 in Vermont. Dept. of Natural Resources. Biennial Report. 279.9 V59R
Include fire statistics.
232. VIRGINIA. STATE FORESTER. Administrative report, 1915-1925. Charlottesville, 1916-26. 99.9 V81
Include records of forest fires, 1920-1925.
233. WASHINGTON. DEPT. OF CONSERVATION AND DEVELOPMENT. DIVISION OF FORESTRY. Annual report, 1st-34th, 1905-1937/38. Olympia, 1906-39. 99.9 W272
Title varies.
Include detailed fire statistics.
234. WASHINGTON FOREST FIRE ASSOCIATION. Annual report, 1st-38th. Seattle, 1908-45. 99.9 W273
Include cost and damage statistics.

235. WEST VIRGINIA. CONSERVATION COMMISSION. Annual report, 1933/34-1942/43. Charleston, 1935-43. 279.9 W52
Include forest fire statistics.
236. WEST VIRGINIA. FOREST, GAME, AND FISH WARDEN. Biennial report, 1st-4th, 1909/10-1915/16. Belington, 1911-16. 99.9 W524
Include forest fire statistics.
237. WIRT, G. H. Brush burning in Pennsylvania. Pa. Dept. Forests and Waters. Bul. 48, rev., 16 p., illus. Harrisburg, 1936. 99.9 P39B
Table shows damage attributed to forest fires caused by brush burning in Pennsylvania, 1913-1935.
238. WISCONSIN. BOARD OF FORESTRY. Report, 1906-1912. Madison, 1906-13. 99.9 W752
Include forest fire statistics.
239. WISCONSIN. STATE CONSERVATION COMMISSION. Biennial report, 1st-16th, 1909-1937/38. Madison, 1909-38. 279.9 W75
Include reports on forest protection, with forest fire statistics.

Insurance

240. AVERILL, C. C., and FROST, L. M. Some factors underlying forest fire insurance in Massachusetts, with special reference to six representative properties. Harvard Forest Bul. 17, 80 p., illus. Petersham, Mass., 1933. 99.9 H264
Includes discussion of methods of determining loss costs, with application to different types of holdings.
241. BREWSTER, D. R. A plan for combined insurance and fire protection. Jour. Forestry 18: 803-805. Dec. 1920. 99.8 F768
Read before the Madison Section of the Society of American Foresters, Sept. 23, 1920.
242. COMPTON, W. M. The desirability of standing timber insurance. Timberman 24(9): 184. July 1923. 99.81 T484
Points out relationship between forest fire protection and forest fire insurance.
243. COWAN, C. S. Logging congress insurance committee report. Timberman 29(8): 206-207. June 1928. 99.81 T484
Recommends reduction of insurance rates when humidity clause forms part of contract.
244. DEW, N. A. Noel Dew discusses insurance. West Coast Lumberman 51(605): 52, 54. Dec. 1926. 99.81 W52
Discusses problem of forest fire insurance from point of view of the insurance companies.
245. ELLIS, E. B. Fire insurance in logging operations. Timberman 29(5): 38-39, 174, 176. Mar. 1928. 99.81 T484
Experience of the Logging Underwriting and Inspection Association, San Francisco, in adjusting rates to risks.
246. FOREST fire insurance for naval stores timber will soon be available. Naval Stores Rev. 46(22): 4. Aug. 29, 1936. 99.81 N22
Brings out effect of fire protection on insurance costs.
247. HERBERT, P. A. Forest insurance and its application in Michigan. Mich. Agr. Expt. Sta. Spec. Bul. 179, 34 p. East Lansing, 1928. Ref. 100 M58S
Includes discussion of adjustment of losses.

248. HERBERT, P. A. Standing timber insurance. 276 p., typewritten. Ithaca, N. Y., 1922. Ref. 99.57 H41
Thesis (M. F.) - Cornell University.
Discusses various aspects of forest fire insurance, including types of damage and adjustment of loss.
249. HULT, G. W. Forest fire insurance. Timberman 28(6): 178-180. Apr. 1927. 99.81 T484
A summary of current practices, including method of valuation.
250. SHEPARD, H. B. Fire insurance for forests. Jour. Land and Pub. Util. Econ. 13: 111-115. May 1937. 282.8 J82
Tables show quantities and values at risk, annual losses, and normal loss rates for merchantable timber and second growth in the Pacific Coast territory.
251. SHEPARD, H. B. Forest fire insurance; exhaustive inquiry indicates its practicability. Weekly Underwriter 136: 1292-1293. June 5, 1937. Libr. Cong.
Includes table showing net loss in board feet and percentage in five classes of Douglas-fir region during 10-year period.
252. SHEPARD, H. B. Forest fire insurance in the Northeastern States. U. S. Dept. Agr. Tech. Bul. 651, 46 p. Washington, D. C., 1939. Ref. 1 Ag84Te
Includes tentative rate schedule based on normal loss and other factors.
253. SHEPARD, H. B. Forest fire insurance in the Pacific Coast States. Jour. Forestry 33: 111-116. Feb. 1935. 99.8 F768
An analysis of "significant factors possibly affecting a forest fire insurance undertaking with the exception of the all-important one of the possible amount of business."
254. SHEPARD, H. B. Forest fire insurance in the Pacific Coast States. U. S. Dept. Agr. Tech. Bul. 551, 168 p., illus. Washington, D. C., 1937. Ref. 1 Ag84Te
Reviewed in Jour. Forestry 35: 883-885. 1937. 99.8 F768
255. SPARHAWK, W. N. Some steps which must be taken in developing forest insurance. Jour. Ins. and Financ. Statis. 3(1): 2-3. July 1923. 284.68 J82
Points out need for establishing fair bases for computing fire damages.
256. SPARHAWK, W. N. Suggestions for rating risks in forest insurance. Jour. Forestry 18: 701-709. Nov. 1920. 99.8 F768
Proposes methods of classifying risks and rating hazards in forest fire insurance, following principles established in commercial fire insurance for structures.
257. TRACY, L. D. Significance of forest fire losses; erroneous impression that fire underwriters have small cause to be interested because of little insurance on standing timber. Weekly Underwriter 125: 989-992, illus. Nov. 7, 1931. Libr. Cong.
Gives examples of losses to insurance companies from nonforest property destroyed as result of forest fires.

Controlled Burning (Except In Longleaf Pine)

258. BOERKER, R. H. Light burning versus forest management in northern California. Forestry Quart. 10: 184-194, illus. June 1912. 99.8 F768
Compares costs and risks of light burning with those of forest protection.
259. BROWN, W. R. Brush burning in northern New Hampshire. Jour. Forestry 21: 54-60. Jan. 1923. 99.8 F768
Reports experimental operations to determine costs of several methods of brush burning.
260. CALIFORNIA divided on light burning. Timberman 21(3): 36, 81-82, 84, 86. Jan. 1920. 99.81 T484
Consists chiefly of excerpts from pamphlet by J. A. Kitts favoring light burning. Gives costs of controlled burning on one project of 1000 acres.
261. CAMPBELL, R. H. Ridding "slash" from western lands. Experience shows that lumber operator should pile and burn debris at time of cutting. Canad. Forestry Jour. 13: 1063-1064. Apr. 1917. 99.8 C16
Includes discussion of costs.
262. COWAN, C. S. Logging insurance and slash burning. West Coast Lumberman 56(2): 16-17, 78. Feb. 1929. 99.81 W52
Proposes method of burning slash to reduce forest-fire losses. Charts show losses in Oregon and Washington during June-August 1926 and 1927.
263. DAVIS, K. P., and KLEHM, K. A. Controlled burning in the western white pine type. Jour. Forestry 37: 399-407. May 1939. 99.3 F768
Costs are discussed on p. 406-407.
264. GRAVES, H. T. The torch in the timber. It may save the lumberman's property, but it destroys the forests of the future. Sunset 44 (4): 37-40, 80-82, 88, 90, illus. Apr. 1920. 110 Su7
In answer to article by S. E. White in preceding issue, cites percentage of cull in fire-damaged timber and excessive costs of safe light burning.
265. GREELEY, W. B. "Piute forestry," or the fallacy of light burning. Timberman 21(5): 38-39. Mar. 1920. 99.81 T484
"The best that can be said for the system is that it is a means for protecting mature timber, although at considerable loss in the stumpage protected, supposedly more cheaply than by an efficient system of detecting and putting out fires."
266. JACOBSON, N. G. Five years joint study of handling pine slash hazard. West Coast Lumberman 56(5): 115-116. May 1929. 99.81 W52
Discusses the place of slash burning in fire control, giving some costs.
267. JACOBSON, N. G. Pine slash hazard control. West Coast Lumberman 53(634): 56-57. Mar. 1, 1928. 99.81 W52
Gives costs of slash burning in several western types.
268. JACOBSON, N. G. Slash disposal in Idaho white pine. Timberman 29(2): 162, 164, 166. Dec. 1927. 99.81 T484
Methods and costs.

269. KITTS, J. A. Killing a billion-dollar industry. Pioneer West. Lumberman 71(11): 9, 11. June 1, 1919. 99.81 P11
Advocates frequent surface firing as an "economic method of removing the forest litter."
270. KOCH, E. The economic aspect of slash disposal. Soc. Amer. Foresters. Proc. 9: 356-358. 1914. 99.9 Sol3P
Discusses costs of brush burning in various western areas and possibilities for eliminating or reducing the practice.
271. LAKIN, B. W. Slash disposal as a commercial proposition; the actual working out of debris destruction on Crookston Lumber Company's extensive limits. Pulp and Paper Mag. Canada 15: 339-340. Apr. 5, 1917. 302.8 P96
Also in Canad. Forestry. 13: 1003-1004. Mar. 1917. 99.8 C16
272. LARSEN, J. A., and LOWDERMILK, W. C. Slash disposal in western white pine forests in Idaho. U. S. Dept. Agr. Dept. Cir. 292, 20 p., illus. Washington, D. C., 1924. 1 Ag84D
Costs of slash disposals, p. 4-7.
273. LIGHT burning as a method of forest protection; report of forestry officials after extended study. Timberman 24(9): 134-136, 138, 140-141. July 1923. 99.81 T484
Reprinted, with introduction by S. L. Kessell and title "The Damage Caused by Creeping Fires in the Forest," as West. Australia. Forests Dept. Bul. 33, 15 p. Perth, 1924. 99.9 W52B
Various economic aspects are discussed.
274. LYMAN, C. K. Principles of fuel reduction. Northwest Sci. 18: 44-48. May 1944. 470 W81
Discusses economic and social aspects of fuel reduction programs.
275. LYONS, R. W. What it costs to clean up a forest. Canad. Forest Jour. 16: 86, 92-93. Feb. 1920. 99.8 C16
Actual costs of burning logging debris by the Laurentide Company on experimental cuttings in balsam-spruce type.
276. MITCHELL, J. A. Methods and cost of brush piling and brush burning in California. Soc. Amer. Foresters. Proc. 8: 340-353. Oct. 1913. 99.9 Sol3P
Details of methods, costs and justification, under varied conditions.
277. MULLOY, G. A. Costs of brush burning. Canada. Forest Serv. Silv. Leaflet 19, 1 p., processed. Ottawa, 1944. 99.9 C16S
Compares labor costs on contract and monthly wage bases.
278. MUNGER, T. T., and WESTVELD, R. H. Slash disposal in the western yellow pine forests of Oregon and Washington. U. S. Dept. Agr. Tech. Bul. 259, 58 p., illus. Washington, D. C., 1931. 1 Ag84Te
Discusses economic considerations governing slash disposal and summarizes advantages and disadvantages, including relative costs, of seven methods of treating slash.
279. MUNGER, T. T., and SIMSON, A. G. Snag falling. Timberman 30(6): 42, 44; (7): 44, 176. Apr., May 1929. 99.81 T484
Costs and results in trials of several methods.
280. NELSON, R. W. Controlled burning at \$40 per acre; is it socially justifiable? Jour. Forestry 37: 815-817. Oct. 1939.
Criticism of an article by K. P. Davis and K. A. Klehm, Controlled Burning in the Western White Pine Type, in Jour. Forestry 37: 399-407. May 1939.

281. OLMSTED, F. E. Fire and the forest-- the theory of "light burning."
Sierra Club Bul. 8: 43-47, illus. Jan. 1911. 500 Sa53
Economic obstacles to the practice in California.
282. OLMSTED, F. E. Light burning in California forests. 4 p. Washington, D. C., U. S. Forest Serv., 1911. 1 F765L
Direct and indirect costs of this method of fire protection.
283. PETTIS, C. R. Reduction of fire hazard on cut-over lands. Northeast. States Forest Fire Conf. 1920 Proc., p. 21-31. 99.51 N81
Discussion by Seaborne and J. J. Fritz includes cost figures.
284. REDINGTON, S. E. What is the truth? The Forest Service and Stewart Edward White agree to study forest fire damage. Sunset 44(6): 56, 58. June 1920. 110 Su7
Discusses actual costs and other aspects of light burning as a form of forest protection for California.
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Slash burning costs, p. 15-17.
286. SHOW, S. B. Forest fire protection in California. Timberman 21(3): 37, 88-90. Jan. 1920. 99.81 T484
Discusses fallacies in theory of light burning as an economical form of forest protection for California.
287. SHOW, S. B., and HAMMATT, R. F. Will fire prevent fire? A discussion of "light burning." Pioneer West. Lumberman 73(3): 8-9, 11. Feb. 1, 1920. 99.81 P11
Gives several examples of loss per acre due to reduction of growth rate, fire scarring, heat killing, and burning down of previously scarred trees in "light" fires, and compares such losses with protection costs.
288. SLASH burning a profitable business. Canada Lumberman 33(14): 32-33, illus. July 15, 1913. 99.81 C16
Includes letter from British Columbia Forest Branch requesting cooperation of owners in slash disposal operations and in submitting reports covering costs and other factors.
289. TRYON, H. H. Hardwood brush disposal in the Hudson Highlands. Black Rock Forest Papers 1: 82-85. 1938. 99.9 B562B
Costs of seven cases are given in man hours per cord and per acre.
290. WEAVER, H. Slash disposal on the Colville Indian Reservation. Jour. Forestry 44: 81-83, illus. Feb. 1946. 99.8 F768
Methods and costs of tractor piling and burning and spot burning in the ponderosa pine region.
291. WEAVER, R. B. The burning of dead and down trees as a practical protection measure. Jour. Forestry 19: 506-511. May 1921.
Method and costs.

See also Damage to Naval Stores Production; Ranges.

DAMAGE TO TIMBER AND REPRODUCTION

General

292. ALDERMAN, O. A. Some effects of fire on pine hardwood forests in southeastern Ohio. Ohio Agr. Expt. Sta. Monthly Bul. 10: 93-95. May/June 1925. 100 Oh3S
Stresses replacement of original pine-hardwood forest by inferior species as an effect of repeated fires.
293. ANDERSON, I. V. Fire losses in ponderosa pine prove value of protection. U. S. Forest Serv. Forest Worker 9(1): 14. Jan. 1933. 1 F76Fw
Based on 1928 lumber prices, average selling-value loss per acre was \$10.86.
294. ANDERSON, I. V. Fire scarred ponderosa pine -- what is the loss? Timberman 35(6): 14-15, 26, illus. Apr. 1934. 99.81 T484
Gives comparisons of selling values of sound and fire-damaged logs of various sizes and analysis of yield of lumber, by grades, of a badly fire-scarred old-growth tree.
295. BARRETT, L. I. Fire damage done to a mature loblolly pine stand. Naval Stores Rev. 38(18): 11. Aug. 4, 1928. 99.81 N22
An experiment in Louisiana showed loss in growth of about 200 board feet per acre during 3 years following a severe fire.
296. BOYCE, J. S. Fire scars and decay. Timberman 22(7): 37, illus. May 1921. 99.81 T484
Cull due to decay entering through fire scars may be as high as 50 percent in incense-cedar, more than 8 percent in Douglas-fir.
297. CONNAUGHTON, C. A. Fire damage in the ponderosa pine type in Idaho. Jour. Forestry 34: 46-51. Jan. 1936. Ref. 99.8 F768
Presents data on mortality in merchantable and reproduction stands and on delayed mortality, particularly in merchantable stands.
298. CORBETT, L. C. Fire wounds. W. Va. Agr. Expt. Sta. Rpt. 1895/96: 226-235. Fairmont, 1897. 100 W52
Points out damage to butt log resulting from fire wounds, and other losses due to fires.
299. DEMMON, E. L. Fire damage in virgin southern pine. South. Lumberman 124(1615): 47, illus. Sept. 11, 1926. 99.81 So82
Points out losses in merchantable volume due to fire scars and pitchiness.
Diagram shows percentage of longleaf and shortleaf pine trees scarred by fire, by diameter classes.
300. GARREN, K. H. Fire wounds on loblolly pine and their relation to decay and other cull. Jour. Forestry 39: 16-22, illus. Jan. 1941. Ref. 99.8 F763
Based on data collected in Calhoun County, Alabama.
301. GARVER, R. D. The price of fires in shortleaf pine. Amer. Lumberman No. 2767, p. 41. May 26, 1928. 99.81 Am3
Also in South. Lumberman 130(1704): 39. May 26, 1928. 99.81 So82
Compares values of sound and fire-damaged logs.

302. GUSTAFSON, R. O. Cull as determined from basal wounds in Kentucky highlands timber. Jour. Forestry 42: 181-184. Mar. 1944. 99.8 F768
Describes method of using open basal wounds due to fire as an index to cull in merchantable timber; illustrates its practical applications.
303. HEDGCOCK, G. G. Fire-scar damage in woodlands heavy. U. S. Dept. Agr. Yearbook 1926: 363-364. 1927. 1 Ag84Y
More than 90 percent of basal or butt rots, causing loss of volume up to 19 percent in volume of hardwoods, is result of forest fires.
304. HEPTING, G. H., and HEDGCOCK, G. G. Decay in merchantable oak, yellow poplar, and basswood in the Appalachian region. U. S. Dept. Agr. Tech. Bul. 570, 30 p. Washington, D. C., 1937. Ref. 1 Ag84Te
Presents analyses of data on 5,882 trees, including proportion of fire-wounded trees and rate of healing.
305. HEPTING, G. H., and HEDGCOCK, G. G. Relation between butt rot and fire in some eastern hardwoods. U. S. Forest Serv. Appalachian Forest Expt. Sta. Tech. Note 14, 2 p., processed. Asheville, N. C., 1935. 1.9 F7623T
Table shows percentage of cull due to butt rot in about six thousand merchantable trees of eight species.
306. HEPTING, G. H., and HEDGCOCK, G. G. Relation between tree diameter and percentage of cull in some eastern hardwoods. U. S. Forest Serv. Appalachian Forest Expt. Sta. Tech. Note 13, 3 p., processed. Asheville, N. C., 1935. 1.9 F7623T
"The cull percentages presented in Figure 4 could probably be applied with reasonable confidence on relatively large units... [with] average fire histories... On land protected from fire the future cull should be less."
307. HEPTING, G. H., and HEDGCOCK, G. G. Relation of cull percent to tree diameter and to percentage of trees with basal wounds in some eastern hardwoods. U. S. Forest Serv. Appalachian Forest Expt. Sta. Tech. Note 16, 3 p., processed. Asheville, N. C., 1935. 1.9 F7623T
97 percent of the basal wounds in the trees studied were caused by fire.
308. JEMISON, G. M. The effect of basal wounding by forest fires on the diameter growth of some southern Appalachian hardwoods. Duke Univ. School Forestry. Bul. 9, 63 p., illus. Durham, N. C., 1944. 99.9 D88
Includes a formula for evaluating loss in growth due to wounding.
309. KAUFERT, F. H. Fire and decay injury in the southern bottomland hardwoods. Jour. Forestry 31: 64-67. Jan. 1933. 99.8 F768
Gives examples of loss of value in terms of volume.
310. LEACH, W. Estimating forest fire damage. Anthracite Forest Protector 8(2): 1-3, processed. Mar./Apr. 1934. 99.8 An82
Gives tables of average loss per acre for various types common in Pennsylvania.
311. LEWIS, G. H. Forest fires in the Mississippi bottomlands. Jour. Forestry 29: 331-332. May 1931. 99.8 F768
Calls attention to extent of deterioration in southern hardwoods following fire.

312. LEWIS, G. H. Loss in merchantable red gum due to two fires. South. Lumberman 135(1756): 40, illus. May 25, 1929. 99.81 So32
Loss was computed for a typical area in Point Coupee Parish, La.
313. LONG, W. H. Effect of forest fires on standing hardwood timber. U. S. Forest Serv. Cir. 216, 6 p. Washington, 1913. 1 F76C
Injuries and resulting cull due to fire scars in the Ozark Mountains of Arkansas.
314. MCCARTHY, E. F., and SIMS, I. H. The relation between tree size and mortality caused by fire in southern Appalachian hardwoods. Jour. Forestry 33: 155-157, illus. Feb. 1935. 99.8 F768
Suggests a method of rating fire intensity, based on mortality in 3-inch class.
315. MARCKWORTH, G. D. Tennessee forest fire manual. Tenn. Forestry Bur. Cir. 6, 17 p. Nashville, 1922. 99.9 T252
Includes instructions for determining fire damage, with tables based on tree heights, location, and stumpage values.
316. MEINECKE, E. P. Quaking aspen; a study in applied forest pathology. U. S. Dept. Agr. Tech. Bul. 155, 34 p., illus. Washington, D. C., 1929. Ref. 1 Ag84Te
Cull traceable to fire scars is discussed on pages 13-16.
317. MILLER, J. M., and PATTERSON, J. E. Preliminary studies on the relation of fire injury to bark-beetle attack in western yellow pine. Jour. Agr. Res. 34: 597-613, illus. Apr. 1, 1927. 1 Ag84J
Tables 4 and 5 show losses in board feet due to bark-beetle attack the year before and 3 years following the fire.
318. MITCHELL, I. A. Fire damage in mature timber. Soc. Amer. Foresters Proc. 9: 239-244. Apr. 1914. 99.9 Sol3
Reports partial results of tests to determine susceptibility to damage and power of recovery in various species in Klamath and Shasta National Forests.
319. MUNGER, T. T. Damage by light surface fires in western yellow-pine forests. Soc. Amer. Foresters Proc. 9: 235-238. Apr. 1914. 99.9 Sol3P
Tables show percentage of each of four degrees of injury in western yellow pine and three other species, and average deduction in scale per log for 900 yellow pine butt logs from Whitman National Forest, Oreg.
320. PINCHOT, G. A study of forest fires and wood production in southern New Jersey. N. J. Geol. Survey. Ann. Rpt. 1898, app., 102 p., illus. Trenton, 1899. 99.51 P65
Ch. 3, Effect of Fire on the Forest Production, presents findings of 49 valuation surveys, showing measurements and yield per acre on typical plots of original forest, second growth on land protected from fire, and second growth on land badly burned.
Also in N. J. Geol. Survey Ann. Rpt. 1899, Rept. on Forests, p. 103-123. Trenton, 1900. 406 P46R
321. RAPRAEGER, E. F. Effect of repeated ground fires upon stumpage returns in western white pine. Jour. Forestry 34: 715-718. July 1936. 99.8 F768
Estimates volume and value loss from (1) understocking and reduced yields, (2) decay traceable to fire, and (3) roughness in trees.

322. SHEPARD, H. B. Fire damage in the northern forest region. U. S. Forest Serv. Northeast. Forest Expt. Sta. Tech. Note 24, 2 p., processed. New Haven? Conn., 1936. 1.9 F7622T
Results of appraisals on 14 burned areas in the spruce-fir region.
323. SHEPARD, H. B. Supposedly harmless surface fires damage old growth forests. U. S. Forest Serv. Pacific Northwest Forest Expt. Sta. Forest Res. Notes 5: 3, processed. Jan. 3, 1931. 1.9 F7629Fr
Reports extent of delayed damage to Douglas-fir, Pacific hemlock, spruce, and balsam fir.
324. STARKER, T. J. Fire resistance in the forest. Jour. Forestry 32: 462-467. Apr. 1934. 99.8 F768
Tables show relative fire resistance of important trees in several sections of the country.
325. STICKEL, P. W. The effect of basal-wounding by fire on trees in the Northeast. U. S. Forest Serv. Northeast. Forest Expt. Sta. Tech. Note 30, 2 p., processed. New Haven? Conn., 1940. 1.9 F7622T
Brings out increasing loss by decay-causing fungi for several years after burning, and recommends severe cutting of scorched trees as soon as possible after burning to avoid this loss.
326. STICKEL, P. W. Forest fire damage studies in the Northeast. II. First-year mortality in burned-over oak stands. Jour. Forestry 33: 595-598. June 1935. Ref. 99.8 F768
Data presented indicate that at least one growing season must elapse before mortality of injured trees can be ascertained. - Adapted from editorial summary.
327. STICKEL, P. W., and MARCO, H. F. Forest fire damage studies in the Northeast - III. Relation between fire injury and fungal infection. Jour. Forestry 34: 420-423, illus. Apr. 1936. 99.8 F768
Recommends early salvage cutting to prevent progressive deterioration of fire-scarred trees through fungus infection.
328. STICKEL, P. W. "No loss; the trees were only scorched." Wooden Nutmeg 12(2): 1, 3, illus. May 1936. 99.8 W852
Seriousness of basal wounding as cause of delayed mortality in northeastern hardwoods.
329. STICKEL, P. W. Some preliminary tables of forest-fire damage values for the northeastern oak region. U. S. Forest Serv. Northeast. Forest Expt. Sta. Tech. Note 31, 2 p., processed. New Haven? Conn., 1940. 1.9 F7622T
Tables show estimated losses per acre for saw timber, cordwood, and reproduction.
330. U. S. FOREST SERVICE. APPALACHIAN FOREST EXPERIMENT STATION. Effects of a light fire on loblolly pine reproduction. U. S. Forest Serv. Appalachian Forest Expt. Sta. Tech. Note 9, 2 p., processed. Asheville, N. C., 1935. 1.9 F7623T
Points out continuing mortality 7 and 26 weeks after the fire and need for postponing damage appraisals to make allowance for this effect.
331. U. S. FOREST SERVICE. LAKE STATES FOREST EXPERIMENT STATION. Effect of spring fires on sprout oak stands. U. S. Forest Serv. Lake States Forest Expt. Sta. Tech. Note 120, 1 p., processed. St. Paul, Minn., 1936. 1.9 F7625T
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Methods Of Appraisal

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